

Image Processing Software

Working with a personal computer linked to a Cray supercomputer, Dr. Y.C. Cho of Ames Research Center developed a new method for measuring motion with multiple exposure images. He captured such images by pointing a camera at a scene, triggering a strobe light several times with the shutter open, and digitizing the resulting exposures on a PC. He then transferred the digitized images to the supercomputer and computed the two-dimensional fourier spectrum of the image. Cho showed that the speed of the object pictured can readily be determined from the width of the stripes that appear in the spectrum image as a result of the object's motion.

The Ames digital image velocimetry technology has been incorporated in a commercially available image processing software package that allows motion measurement of images on a PC alone. The software is IMAGELAB FFT, marketed by Werner Frei Associates, Venice, California.

The images shown were produced on an IBM PC. Shown below is a double exposure of a moving car; at right is a fourier spectrum of the moving car's image. In the center of the latter image are

a series of yellow/green stripes that provide a key to easy calculation of the moving car's speed; the speed is inversely proportional to the width of the stripes, the time interval between exposures and the magnification of the imaging lens.

IMAGELAB FFT is a general purpose image processing system with a variety of other applications, among them image enhancement of fingerprints and use by banks and law enforcement agencies for analysis of videos run during robberies. Werner Frei Associates' customers are for the most part researchers who use the software to analyze, restore or enhance imagery.

